

## Thermochemical Equations

The complete combustion of pure, liquid acetic acid to form liquid water and carbon dioxide gas at constant pressure releases 871.7 kJ per mole of acid.

- i) Write a balanced thermochemical equation for this reaction.
- ii) Draw an enthalpy diagram for the reaction.
- iii) If 0.500 g of acetic acid is burned, what amount of energy is released?

Consider the following reaction, which occurs at room temperature and pressure:



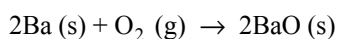
Which has a higher enthalpy under these conditions, 2Cl or Cl<sub>2</sub>? Explain.

Consider the following reaction:



- i) Is heat absorbed or evolved in the course of this reaction?
- ii) Calculate the amount of heat transferred when 60.0 g of methanol is decomposed in the above reaction at constant pressure.
- iii) For a given sample of methanol, the enthalpy change on reaction is 18.5 kJ. How many grams of hydrogen gas are produced?
- iv) What is the value of  $\Delta H$  for the reverse of this reaction? How many kilojoules of heat are released when 27.0 g of CO(g) reacts completely with H<sub>2</sub>(g) to form CH<sub>3</sub>OH(g) at constant pressure?

The value of  $\Delta H^\circ$  for the reaction below is -1107 kJ:



How many kJ of heat are released when 5.75 g of Ba reacts with 0.230 g of O<sub>2</sub> to form BaO (s) ?